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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,543	01/07/2002	Joon-Won Kang	Honeywell No. B10-17363	2452

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EXAMINER
MANDALA, VICTOR A

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 02/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/040,543	KANG, JOON-WON	
	Examiner	Art Unit	
	Victor A Mandala Jr.	2826	

-- The MAILING DATE of this communication appears on the cover sh et with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) *23-52* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/ Restriction Response

1. Applicant's election with traverse of restriction of device and method in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the device could not be made by processes materially different from the claimed method. This is not found persuasive because the arguments by the Applicant did not specifically explain why the source and the drain could not be made by diffusion instead of implantation.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1-5 and 7-21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,388,299 Kang et al.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

2. Referring to claim 1, a contactless acceleration switch system, comprising in combination: a substrate layer, (Figure 14n #180), containing a source, (Figure 14n labeled source), a drain, (Figure 14n labeled drain), and a threshold adjustment channel, (Figure 14n examiner's label #500); a gate insulating layer, (Figure 14n #290), located substantially above the source, (Figure 14n labeled source), the drain, (Figure 14n labeled drain), and the threshold adjustment channel, (Figure 14n examiner's label #500); at least two insulator posts, (Figure 14n #184), wherein the source, (Figure 14n labeled source), the drain, (Figure 14n labeled drain), the threshold adjustment channel, (Figure 14n examiner's label #500), and the gate insulating layer, (Figure 14n #290), are located substantially between the at least two insulator posts, (Figure 14n #184); a mass, (Figure 14n #214); and a spring, (Figure 14n #234, 250, & 292), substantially supporting the mass, (Figure 14n #214), above the substrate layer, (Figure 14n #180), wherein the spring, (Figure 14n #234, 250, & 292), is attached to each of the at least two insulator posts, (Figure 14n #184).

3. Referring to claim 2, a contactless acceleration switch system, wherein the substrate layer, (Figure 14n #180), is composed of a semiconductor material, (Col. 11 Line 39).

4. Referring to claim 3, a contactless acceleration switch system, wherein the semiconductor material is silicon, (Col. 11 Line 38-42).

5. Referring to claim 4, a contactless acceleration switch system, wherein the gate insulating layer, (Figure 14n #290), is composed of silicon dioxide, (Col. 12 Line 51).

6. Referring to claim 5, a contactless acceleration switch system, wherein the at least two insulator posts, (Figure 14n #184), are composed of an insulating layer, (Col. 11 Lines 39-42).

7. Referring to claim 7, a contactless acceleration switch system, wherein the mass, (Figure 14n #214), is composed of an electrically conductive material, (Col. 11 Lines 64-67).

8. Referring to claim 8, a contactless acceleration switch system, wherein the electrically conductive material is doped silicon, (Col. 11 Lines 64-67).

9. Referring to claim 9, a contactless acceleration switch system, wherein the spring is composed of an electrically conductive material, (Col. 12 Line 38).

10. Referring to claim 10, a contactless acceleration switch system, wherein the electrically conductive material is doped silicon, (Col. 12 Lines 37-38).

11. Referring to claim 11, a contactless acceleration switch system, wherein the threshold adjustment channel, (Figure 14n examiner's label #500), is doped to a level to cause the threshold adjustment channel, (Figure 14n examiner's label #500), to invert when the mass, (Figure 14n #214), moves substantially towards the substrate layer, (Figure 14n #180) and (Col. 7 Lines 14-16).

It is inherent that all channels are doped such that they invert at the Voltage Threshold and it is known that when the mass is closer to the substrate the voltage drop between the mass and the channel has more effect to invert the channel, and appropriately doping the channel that corresponds to the Vth which is induced by the mass movement.

12. Referring to claim 12, a contactless acceleration switch system, wherein the gate insulating layer, (Figure 14n #290), substantially limits electric conduction between the mass, (Figure 14n #214), and the substrate layer, (Figure 14n #180).

It is inherent that an insulator insulates, such as the gate insulator will limit the electrical conduction between the mass and the substrate layer.

13. Referring to claim 13, a contactless acceleration switch system, wherein the mass, (Figure 14n #214), operates as a moveable gate, (Figure 14n #214 & Figure 3 and 4).

14. Referring to claim 14, a contactless acceleration switch system, wherein the mass, (Figure 14n #214), the source, (Figure 14n labeled source), and the drain, (Figure 14n labeled drain), operate as a field effect transistor, (Col. 5 Line 31).

15. Referring to claim 15, a contactless acceleration switch system, wherein an air gap is located substantially between the mass, (Figure 3&4 #46), and the substrate layer, (Figure 3&4 #48), when an acceleration level is substantially below a threshold acceleration value, (Figure 3 and 4 & acceleration labeled #60) and (Col. 7 Lines 20-27).

16. Referring to claim 16, a contactless acceleration switch system, wherein the mass, (Figure 3&4 #46), moves substantially towards the substrate layer, (Figure 3&4 #48), when a threshold acceleration value is detected, (Figure 3 and 4 & acceleration labeled #60) and (Col. 7 Lines 20-27).

17. Referring to claim 17, a contactless acceleration switch system, wherein the threshold adjustment channel inverts when the mass moves towards the substrate layer.
It is inherent that all channels are doped such that they invert at the Voltage Threshold and it is known that when the mass is closer to the substrate the voltage drop between the mass and the channel has more effect to invert the channel, and appropriately doping the channel that corresponds to the Vth which is induced by the mass movement.

18. Referring to claim 18, a contactless acceleration switch system, wherein current flows between the source and the drain when the threshold adjustment channel inverts.

It is inherent to normal mosfet behavior that the channel must be inverted for the transistor to be on and that is when current will flow from the source and drain.

19. Referring to claim 19, a contactless acceleration switch system, wherein the source and the drain act as electrodes providing an electrical signal that indicates that a threshold acceleration value is detected.

A source and drain are commonly provided with source and drain electrodes, so the expression that the elements act as electrodes is inherent to all mosfets.

20. Referring to claim 20, a contactless acceleration switch system, wherein a substantially constant voltage is applied between the mass and the substrate layer.

At a given point of operation it is clear that a constant voltage between the substrate and the gate because the Vth for a given mosfet is always constant.

21. Referring to claim 21, a contactless acceleration switch system, wherein the substantially constant voltage is determined by factors selected from the group consisting of mass size, spring constant, operation range, and hysteresis, (Col. 8 Lines 26-59).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,627,397 Kano et al.

22. Referring to claim 1, a contactless acceleration switch system, comprising in combination: a substrate layer, (Figure 1 & 4 #1), containing a source, (Figure 1 & 4 #15 or 16), a drain, (Figure 1 & 4 #15 or 16), and a threshold adjustment channel, (Figure 4 #19); a gate insulating layer, (Figure 4 #2), located substantially above the source, (Figure 1 & 4 #15 or 16), the drain, (Figure 1 & 4 #15 or 16), and the threshold adjustment channel, (Figure 4 #19); at least two insulator posts, (Figure 1 & 4 #3 or 4), wherein the source, (Figure 1 & 4 #15 or 16), the drain, (Figure 1 & 4 #15 or 16), the threshold adjustment channel, (Figure 4 #19), and the gate insulating layer, (Figure 4 #2), are located substantially between the at least two insulator posts, (Figure 1 & 4 #3 or 4); a mass, (Figure 1 & 4 #14); and a spring, (Figure 1 #8, 9, 10, & 11), substantially supporting the mass, (Figure 1 & 4 #14), above the substrate layer, (Figure 1 & 4 #1), wherein the spring, (Figure 1 #8, 9, 10, & 11), is attached to each of the at least two insulator posts, (Figure 1 & 4 #3 or 4).

23. Referring to claim 5, a contactless acceleration switch system, wherein the at least two insulator posts, (Figure 1 & 4 #3 or 4), are composed of an insulating layer, (Col. 11 Lines 39-42).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,627,397 Kano et al.

24. Referring to claim 6, a contactless acceleration switch system, wherein the insulating material is silicon dioxide.

Kano et al. discloses the claimed invention except for the insulating post being made of silicon dioxide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the insulating post out of silicon dioxide instead of silicon nitride since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

25. Referring to claim 22, a contactless acceleration switch system, comprising in combination: a silicon substrate layer, (Figure 1 & 4 #1), containing a source, (Figure 1 & 4 #15 or 16), a drain, (Figure 1 & 4 #15 or 16), and a threshold adjustment channel, (Figure 4 #19), wherein the threshold adjustment channel, (Figure 4 #19), is doped to a level to cause the threshold adjustment channel, (Figure 4 #19), to invert, (See *** below), when a mass, (Figure 1 & 4 #14), moves substantially towards the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14), and wherein the source, (Figure 1 & 4 #15 or 16), and the drain, (Figure 1 & 4 #15 or 16),

act as electrodes providing an electrical signal that indicates that a threshold acceleration value is detected, (See **** below); a gate insulating layer, (Figure 4 #2), located substantially above the source, (Figure 1 & 4 #15 or 16), the drain, (Figure 1 & 4 #15 or 16), and the threshold adjustment channel, (Figure 4 #19), wherein the gate insulating layer, (Figure 4 #2), is composed of silicon dioxide, (See ** below), and wherein the gate insulating layer, (Figure 4 #2), substantially limits electric conduction, (See **/** below), between the mass and the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14); at least two insulator posts composed of silicon dioxide, wherein the source, (Figure 1 & 4 #15 or 16), the drain, (Figure 1 & 4 #15 or 16), the threshold adjustment channel, (Figure 4 #19), and the gate insulating layer, (Figure 4 #2), are located substantially between the at least two insulator posts, (Figure 1 & 4 #3 or 4 & Col. 11 Lines 39-42); the mass, (Figure 1 & 4 #14), composed of doped silicon, wherein the mass, (Figure 1 & 4 #14), operates as a moveable gate, (Figure 1 & 4 #14), wherein the mass, (Figure 1 & 4 #14), the source, (Figure 1 & 4 #15 or 16), and the drain, (Figure 1 & 4 #15 or 16), operate as a field effect transistor, (Col. 1 Line 62), wherein an air gap, (Figure 4), is located substantially between the mass, (Figure 1 & 4 #14), and the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14), when an acceleration level is substantially below the threshold acceleration value, wherein the mass, (Figure 1 & 4 #14), moves substantially towards, (Col. 2 Lines 1-7), the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14), when the threshold acceleration value is detected, (See *** below), wherein the threshold adjustment channel, (Figure 4 #19), inverts, (See **//** below), when the mass, (Figure 1 & 4 #14), moves towards the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14), wherein current flows between the source, (Figure 1 & 4 #15 or 16), and the drain, (Figure 1 & 4 #15 or 16), when the threshold adjustment channel,

(Figure 4 #19), inverts, (See **//** below), and wherein a substantially constant voltage, (See */* below), is applied between the mass, (Figure 1 & 4 #14), and the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14); and a spring, (Figure 1 #8, 9, 10, & 11), composed of doped silicon, (Col. 4 Lines 7-11 and see */ below), substantially supporting the mass, (Figure 1 & 4 #14), above the silicon substrate layer, (Figure 1 & 4 #1 & Col. 4 Line 14), wherein the spring, (Figure 1 #8, 9, 10, & 11), is attached to each of the at least two insulator posts, (Figure 1 & 4 #3 or 4 & Col. 11 Lines 39-42).

** Kano et al. discloses the claimed invention except for the gate insulator being made of silicon dioxide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the gate insulator out of silicon dioxide instead of silicon nitride since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

*** It is inherent that all channels are doped such that they invert at the Voltage Threshold and it is known that when the mass is closer to the substrate the voltage drop between the mass and the channel has more effect to invert the channel, and appropriately doping the channel that corresponds to the Vth which is induced by the mass movement.

**** A source and drain are commonly provided with source and drain electrodes, so the expression that the elements act as electrodes is inherent to all mosfets.

/ It is inherent that an insulator insulates, such as the gate insulator will limit the electrical conduction between the mass and the substrate layer.

// It is inherent to normal mosfet behavior that the channel must be inverted for the transistor to be on and that is when current will flow from the source and drain.

*/ Kano et al. discloses the claimed invention except for the spring and gate being made of doped silicon. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the spring and gate out of doped silicon instead of polysiliconsilicon since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ
416.

/ At a given point of operation it is clear that a constant voltage between the substrate and the gate because the Vth for a given mosfet is always constant.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A Mandala Jr. whose telephone number is (703) 308-6560. The examiner can normally be reached on Monday through Thursday from 8am till 6pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

VAMJ
February 6, 2003

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